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D Handayani

*University of Brawijaya, dh753@uow.edu.au*

B Meyer

*University of Wollongong, bmeyer@uow.edu.au*

J Chen

*University of Wollongong, jiezhong@uow.edu.au*

S Brown

*University of Wollongong, simonb@uow.edu.au*

T Mitchell

*University of Wollongong, toddm@uow.edu.au*

*See next page for additional authors*

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### Abstract

Abstract of poster that presented at IUNS 20th International congress of Nutrition, Granada, Spain, September 15-20, 2013.

### Keywords

rats, triacylglycerol, accumulation, diet, hepatic, fat, increases, mushroom, dose, high, fed

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### Authors

D Handayani, B Meyer, J Chen, S Brown, T Mitchell, and Xu-Feng Huang

# HIGH-DOSE MUSHROOM INCREASES HEPATIC ACCUMULATION OF TRIACYLGLYCEROL IN RATS FED WITH HIGH-FAT DIET

*D. Handayani<sup>1</sup>, B. Meyer<sup>2</sup>, J. Chen<sup>2</sup>, S. Brown<sup>2</sup>, T. Mitchell<sup>2</sup>, XF. Huang<sup>2</sup>,*

<sup>1</sup>Nutrition Department-Faculty of Medicine, University of Brawijaya, Malang, East Java, Indonesia

<sup>2</sup>School of Health Sciences and Illawarra Health and Medical Research Institute, University of Wollongong, Wollongong, Australia

**Background and objectives:** Shiitake mushroom is a functional food that contains active biological components such as beta glucan and eritadenine. The Shiitake has been shown to have health benefits including plasma TAG lowering and the prevention of body weight gain. Yet the underlying mechanisms are largely unknown. The aim of this study was to assess the potential underlying mechanism of Shiitake mushrooms to prevent body weight gain in rats fed a high fat diet (HFD).

**Methods:** Forty Wistar rats were divided randomly into four groups. Rats in the control group were given HFD only and rats in the treatment group were fed HFD enriched with Shiitake mushroom powder in low dose (LD-M, 0.7% wt:wt), medium dose (MD-M, 2% wt:wt) and high dose (HD-M, 6% wt:wt) for 6 weeks. Diets were isocaloric containing ~50% energy from fat. After 6 weeks' dietary intervention, rats were sacrificed; blood and tissue samples were collected.

**Results:** The rats fed HD-M showed a significantly higher ratio of liver weight to 100 g body weight ( $p < 0.05$ ), a more severe hepatic steatosis marker such as hepatocyte ballooning ( $p < 0.0001$ ) and more liver triacylglycerol (TAG) content than LD-M and MD-M ( $p < 0.05$ ). HD-M also showed a significantly decreased ratio of phosphatidylcholine (PC) to phosphatidylethanolamine (PE) compared to HFD ( $p < 0.05$ ) but there were no differences compared to HD-M and MD-M. This study also showed a positive association between the dosage, liver TAG and liver ballooning histology. A negative association was found between the dosage of mushroom and the ratio of liver PC to PE.

**Conclusion:** The study showed that high-dose shiitake mushroom increased TAG accumulation in liver. This could partially explain how consumption of mushrooms lowers blood levels of TAG in rats fed with high-fat diet.

**Key words:** Shiitake mushroom, Triacylglycerol, Phosphatidylcholine, Phosphatidylethanolamine